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**Cristina Tarsi\*** ([cristina.tarsi@unimi.it](mailto:cristina.tarsi@unimi.it)), Via Saldini 50, 20133 Milan, MI, Italy. *Limiting Sobolev inequalities and the 1-biharmonic operator.*

In this talk we present recent results, obtained in collaboration with E. Parini (Univ. Marseille) and B. Ruf (Univ. Milano), on optimal embeddings of the space of functions whose distributional Laplacian belongs to  $L^1(\Omega)$ , where  $\Omega$  is a bounded domain. This function space turns out to be strictly larger than the Sobolev space  $W^{2,1}$ , in which the whole set of second order derivatives is considered. In particular, we discuss sharp embedding inequalities which allow to improve the optimal summability results for solutions of Poisson equations with  $L^1$ -data by Maz'ya ( $N \geq 3$ ) and Brezis-Merle ( $N = 2$ ). We then consider optimal embeddings of the mentioned space into  $L^1$ , which yields the corresponding eigenvalue problems for the 1-biharmonic operator (a higher order analogue of the 1-Laplacian). We finally discuss possible applications of this operator to the image processing. (Received February 23, 2015)